In the claims:

Claims:

1-19. Cancelled.

20. (Currently Amended) A gas-phase-reactant-pulsed electric generator ~~device for generating energy~~, comprising:

an emitter having at least a reaction surface, the emitter operable to emit hot electrons in pulses into the reaction surface to initiate chemical reactions,

a reaction region surrounding the emitter operable to contain the chemical reactions initiated on the reaction surface, the chemical reactions producing highly vibrationally excited products; and

a collector near the reaction region, the collector comprising at least a conductor whose first surface is in contact with ~~at least partly bounds the~~ a reaction region that is completely or partly enclosed by the first surface and whose second surface is in contact with a semiconductor, the thickness of the conductor from the first surface to the second surface being sufficiently thin to permit hot electrons emitted from highly vibrationally excited products to the conductor to travel through the conductor into the semiconductor, charging the semiconductor to a useful forward bias that is ~~can be~~ converted into electrical energy~~, the electrical energy being greater than energy input to the emitter to emit hot electrons that initiate the chemical reactions~~.

21. (Original) The device of claim 20, wherein the reaction region includes a surface of the emitter.

22. (Original) The device of claim 20, wherein the reaction region includes a surface of the collector.

23. (Original) The device of claim 20, wherein the emitter and the collector are on a same surface.

24. (Original) The device of claim 20, wherein the emitter and the collector are a same one device.

25. (Original) The device of claim 20, wherein the reaction region is formed as a V-channel by the surrounding collector.

26. (Original) The device of claim 20, wherein the reaction region is partly enclosed by the surrounding collector.

27. (Original) The device of claim 20, wherein the emitter includes:

an insulator;

a first electrode connected to a first side of the insulator; and

a second electrode connected to a second side of the insulator, the second electrode forming the reaction surface,

wherein energy pulses can be applied across the first electrode and the second electrode to stimulate reaction on the reaction surface.

28. (Original) The device of claim 27, wherein the insulator has thickness dimension that is less than three times the energy diffusion length of hot electrons traversing the insulator.

29. (Original) The device of claim 20, wherein the emitter includes one or more of a forward biased diode, a metal-insulator-metal device, a semiconductor-insulator metal device, a semiconductor-metal device, an optical device, and a quantum well.

30. (Original) The device of claim 20, wherein the device further includes a strip transmission line connected to the emitter for driving energy pulses into the emitter.

31. (Original) The device of claim 30, wherein the strip transmission line includes a dielectric material in contact with one or more electrodes.

32. (Original) The device of claim 30, wherein the strip transmission line includes a dispersive transmission line designed to compress pulses.

33. (Original) The device of claim 20, wherein the reaction surface includes a catalyst.

34. (Original) The device of claim 20, wherein the collector includes a reaction surface.

35. (Original) The device of claim 20, wherein the emitter includes a semiconductor whose p side is ohmically or almost ohmically attached to the reaction surface.

36. (Original) The device of claim 20, wherein the emitter includes an electrically pulsed solid state optically emitting diode.

37. (Previously Presented) The device for generating energy as claimed in claim 20, wherein the collector further includes:

a conductor electrode connected to the conductor; and

a collector electrode in ohmic contact with the semiconductor,

wherein the hot electrons created in the collector cause the semiconductor to become forward biased and produces useful voltage across the collector electrode and the conductor electrode.

38. (Canceled)

39. (Previously Presented) The device of claim 20, wherein the collector further includes:
a quantum well structure directly connected to the first conductor surface.

40. (Previously Presented) The device of claim 20, wherein the collector includes:
a Schottky diode directly connected to the second conductor surface.

41. (Previously Presented) The device of claim 20, wherein the first conductor conducting surface is supplied with one or combination of fuel and oxidizer additives.

42. (Previously Presented) The device of claim 20, wherein the first conducting surface with includes superlattice structures.

43. (Previously Presented) The device of claim 20, wherein the conductor is formed from material with a Debye temperature property chosen to optimize the ratio of hot electrons and phonons generated upon exposure to reaction products.

44. (Original) The device of claim 20, wherein the collector collects electromagnetic radiation.

45. (Previously Presented) The device of claim 20, wherein the semiconductor includes:
a highly doped p+ region;
a p doped region; and
a n doped region.

46. (Original) The device of claim 20, wherein the device further includes a fuel port in close proximity to the emitter.

47. Cancelled.

48. (Currently Amended) A device for extracting a net excess of useful work, comprising:

an emitter having at least a reaction surface, the emitter operable to emit hot electrons in pulses into the reaction surface to initiate chemical reactions,

a reaction region surrounding the emitter operable to contain the chemical reactions initiated on the reaction surface, the chemical reactions producing highly vibrationally excited products; and

a collector near the reaction region, comprising at least a conductor whose first surface at least partly bounds the reaction region and whose second surface is in contact with a semiconductor, the thickness of the conductor from the first surface to the second surface being sufficiently thin to permit hot electrons emitted from highly vibrationally excited products to the conductor to travel through the conductor into the semiconductor, charging the semiconductor to a useful forward bias that is ~~can be~~ converted into electrical energy~~, the electrical energy being greater than energy input to the emitter to emit hot electrons that initiate the chemical reactions~~,

the dimension of the reaction region being such that a distance from a geometric center of the reaction region to a nearest collector surface is less than three times an energy diffusion length of the highly vibrationally excited reaction products.

49. (Previously Presented) The device of claim 20, wherein the electrical energy is stored and used to energize the emitter to emit hot electrons.

50. (Cancelled)

51. (Currently Amended) The device of claim 20, wherein the emitter is energized initially from one or more of pulse of energy~~, pulse of chemical reactants~~, reaction intermediates, autocatalysts, monopropellant~~monopropellants~~, reaction stimulators, optical pulses, pulsed laser radiation, optical radiation.

52. (Currently Amended) The device of claim 20, wherein the conductor includes ~~one or more of~~ catalysts~~, oxides, metals~~.

53. (Previously Presented) The device of claim 20, wherein the conductor includes a plurality of layers of one or more materials.

54. (Previously Presented) The device of claim 20, wherein the reaction surface and the first conductor surface are formed from same material.

55. (Previously Presented) The device of claim 20, wherein the emitter and the collector are next to one another.

56. (Previously Presented) The device of claim 20, wherein the emitter and the collector are one same component and the reaction surface is the first conductor surface.

57. (Previously Presented) The device of claim 40, wherein the semiconductor forms part of the Schottky diode.

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